L. R. B. & M. JOURNAL

VOLUME 30 NUMBER 4

SEPTEMBER 1949

The Function of Cost in Pricing

A Week at I. B. M.—Afterthoughts

Published by

LYBRAND, ROSS BROS. & MONTGOMERY

Certified Public Accountants

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The Function of Cost in Pricing

BY DONALD M. RUSSELL

The setting of prices is a top responsibility of top management and when the cost accountant provides estimates of future costs for the guidance of management, he participates in that top responsibility. If an enterprise is to survive, management needs all the hard cold facts about its internal affairs that can be assembled. Price setting decisions have far-reaching effects upon the operations of the entire economic system. Business is so controlling in the entire social economy that we must have intelligent planning of business, for the long-run, and for the good of the greatest number of people.

We appear to be sliding off from the peak of inflation. In the last few months the steel mills have operated at much lower rates of capacity than for some time and are reported to be soliciting orders for the first time in several years. Lower prices may be on the way and it is to be hoped that as they decline they will uncover successive layers of new demand. Business is plagued with rigid costs and high break-even points. The cost accountant may soon have fresh opportunities to use his analyses for cost control, reduction of inventories, elimination of wastes and inefficiencies, and lowering the break-even point by attacking the fixed charges. To participate effectively in the decisions of top management the cost accountant must keep abreast of current business problems.

External Influences Affecting Price: In an uncontrolled agricultural economy, the farmer may take his crop to market and receive the current price of the day. If supply is high he gets less; if low, and customers bid for his produce, he receives more. The same principles are at work in the industry but there are many complexities, e.g.:

1. In competition within an industry, the strongest member of the industry, measured in ability to produce aud distribute at lowest cost, will usually lead in determining price.
2. Competition in an industry where differences in quality of the product are slight will be forced to follow a decrease in price by the leader.
3. Competition will not necessarily follow an increase in price by the leader, if the

Editor's Note: This article is based upon a paper presented by Mr. Russell before The National Association of Cost Accountants in Chicago on June 20, 1949.

original price shows an acceptable profit; therefore the leader of an industry may be prevented from increasing prices, by competition from the weaker members of the industry.

4. Prices tend to be supported, as a floor, by the costs of the weakest member of an industry who is able to obtain a share of the total available market, and by his unwillingness to sell for less than cost.
5. The law of supply and demand sometimes appears to work in reverse; buyers anticipate continually increasing prices and the volume of buying increases with price; on the other hand, after prices have slipped a little, a general opinion that prices are on the way down may cause buyers to hold back and the volume of buying then decreases with price, causing a more precipitate decline than would otherwise occur.
6. Unfair price boosts tend to defeat themselves; monopolistic privileges are constantly being whittled away; applied science finds substitute materials with which to compete, or new technological processes are devised to reduce costs, thus making it possible for those who were formerly high cost producers to enter competitive price areas.
7. In certain industries where raw material is the largest element in the cost, prices naturally vary in close relation to the cost of the raw material, e.g., meats, textiles and grain products made from wheat or corn.
8. In other industries where labor is more important, wage rates have the greatest influence. In the automobile industry, for example, the cost of productive labor and of the labor engaged in making special tools, dies and jigs, is a major element. Cutting down the length of the wheel base of an automobile or reducing the size of the engine has little effect on total cost. The punch presses go up and down just as many times to produce a narrow door panel as a wide door panel and the number of holes to be drilled and bolts to be fastened may be the same for a small engine as for a larger one of similar design.
9. Any price change may have repercussions from unexpected sources. A new product priced lower than a competitor's, because differential cost computations show we can produce it without increasing fixed charges, may bring retaliation from the competitor by price-cutting on our main product.

The Dynamics of Automobile Demand, published by General Motors Corporation in 1938, consisted of a collection of papers presented at meetings of the American Statistical Association and the Econometric Society held in Detroit on December 27, 1938. The authors of these papers studied the elasticity of demand, that is the possible effects on volume, of varying prices, during the depression of 1937–38. These papers include the following computed results for the X Motor Company:

In November, 1937, the price of $704 per car resulted in production of 653,000 cars. To bring out a production of 1,000,000 cars at that time, based on their evaluation of the intensity of the demand, it would have been necessary to reduce the price to $569, or by about 20 pct. The price of $569 per car would have been less than the variable out-of-pocket costs per car. The more cars they sold the more money they would have lost.

By January, 1938, the intensity of demand had fallen further and to bring out a production of 1,000,000 cars the price would have needed to be reduced to $493 and by June, 1938, to $429, a price which would have recovered about 75 pct. of the variable out-of-pocket expenses.

Cost accountants know (and labor union members should appreciate) that besides the danger of pricing ourselves out of a market, there is also a danger of costing ourselves out. As stated by Mr. Stephen M. Dubrul in his summary of *The Dynamics of Automobile Demand:*

> There isn't a farmer in the country who will pick and pack a crop when he knows that the market price will return him less cash than he must pay out for picking and packing. He will let the crop rot instead, as everyone knows; which causes unemployment among agricultural workers just as the businessman's refusal to sell for less than his cost of production for any length of time results in unemployment of workers in his plant.

In automobile production, the variable costs account for 85 to 90 pct. of the total product cost. This must be true in a great number of industries producing the engineered consumer goods which play so important a part in determining how much employment we can sustain.

In the long run what counts most is technological progress under mass production techniques, using constantly new and improved tools and new and better methods of planning and production. Cost accounting plays its part in assembling the factual data required to control and balance the production techniques. External factors control the ceiling of the possible price range of a product but the total production and distribution costs are the most important factor in determining the floor of the price range. We shall consider later the important manner in which costs also control the quality of the product, another powerful factor in the setting of competitive prices.

Economic Costs and Income: I expect every accountant would agree that economic concepts of cost and income should control in price setting.

Historical records of past costs of material and labor must be adjusted for forward estimates. They must be brought up to the present and projected into the future to be of service in price setting. This is equally true for every element of overhead expenses and all items entering into total product cost.

The allowances for depreciation of property, plant and equipment warrant elaborate study. Future retirements and probable replacements can be estimated based on study of the acquisition dates, cost, and estimates of useful life, of the components of present fixed asset accounts. If our plant accounts represent a moving average of prices for a 20-year period, and prices are on an upward trend, the allowances for depreciation currently charged into costs, increase too slowly to provide for replacements at inflated prices. We cannot afford to postpone collecting from our customers, through prices, the amounts needed for replacements.

My plea as to economic concepts in expounding the function of cost in pricing is to maintain the ideal of objectivity in accounting to the maximum extent, express our cost figures first, based on experience on the historical dollar cost basis, and then to proceed with subjective estimates presented to management for what they are. There is no reason why cost accounting should not give effect to any economic viewpoint as a tandem presentation, first based on cost and then extended to the broader viewpoint with appropriate explanations. We shall lose effectiveness of cost procedures, however, if we lose sight of objectivity in accounting. You cannot solve fundamental weaknesses in the national economy such as labor-management warfare or excessive government spending by changing the definition of cost, any more than you can make democracy work by changing the definition of democracy, or truly balance the federal budget by anticipating instalments of corporation federal income taxes.

Objectivity in Accounting: Price is one phase of value. Value is a subjective quality, existing differently in the minds of different persons. A retail store property consisting of four brick walls, a concrete floor and a roof, constructed at a given location may in the mind of one person constitute a liability rather than asset, as he can see only the taxes, insurance and maintenance expenses without offsetting revenue; whereas, other persons may see in that structure the means of carrying on a successful trading business, or a gospel mission, or a tool and die shop or a home for a family. In the minds of these different persons the same structure may have exchange valuations ranging all the way from nothing to $100,000 or more.

Accountants have long drawn a distinction between value and cost. Such expressions as "net worth" and "market value" are frowned upon or used with great care, because we know that such words denote ideas which mean different things in the minds of different readers of financial statements.

Price setting is clearly a subjective process. It is the final result of all of the thoughts of the management group about the value of the product. One thing is certain, however; if the prices offered result in completed exchanges of goods for dollars, they lose their subjective characteristics. They then become the objective dollars in the bank and unless the prices are realistic and hard enough to pay for all costs by which the goods are produced, objective loss will result, objective capital will disappear and if this recurs often enough any enterprise will cease to be an enterprise.

Cost is a different breed of animal. It is not primarily an idea of value. The use of the word in accounting is narrower than in economics. We

cannot say that cost is purely objective in nature, but we can say that objectivity in computing cost is a major goal. Cost and ownership go together; when an exchange takes place the new owner has frozen a value judgment into a cost and he is definitely stuck with it, until he resells the property. The principal job that management asks of the cost accountant is to trace through the complexities of the business, the total expenditures which have benefited the products made and sold and to do this job as objectively as possible.

Attitudes in cost accounting which tend to defeat objectivity and decrease confidence in cost results are those of some few who may consider that anything goes because the job is in a rush or who allocate costs to a product because "it has a good margin and can stand it." Allocations of institutional advertising or administrative and general expenses in proportion to the amounts of the sales of respective products is another violation of objectivity. If we are tracing actual expenditures to determine how many dollars reside in a product, either for the purpose of adding a reasonable profit to find a selling price, or, for the purpose of establishing a yardstick against which we intend to compare the selling price to find the profit, how can we possibly permit the cost computation to be influenced by the amounts of sales? Allocations of expenses which are too general in type to be apportioned on another more direct basis, should be based on the underlying prior costs incurred and not on sales.

Standards for Estimating: If a cost accountant is to participate successfully in price setting he must have done previously a thorough job of cost research and he must have gathered a store of factual information about the plant, the products, the operations, the physical standards of performance, the distribution methods, the composition of expense accounts, inventory accounts and plant accounts. He will apply the same underlying data (which is clearly objective in nature) for his other functions, of cost and expense control, providing current data for financial accounting, inventory computations and budget-making. He cannot hope to forecast costs without a thorough knowledge of performance characteristics.

The cost accountant should be able to guarantee to management the soundness of the physical standards on which operational estimates are made. He should be familiar with floor plans and be informed promptly of all changes, he should know the raw materials and their yields, the labor operations and the expected production in physical units per man-hour, power consumption per machine-hour, and similar operational data. This calls, of course, for close col-

laboration with the plant engineers and production men. If he has gained control over this type of data, he can price it on any basis required, past cost, present cost or estimated future cost. The pricing job also, of course, involves knowledge of normal financial ratios, or standards, such as proper ratios of indirect costs to direct costs in a press shop at normal volume, or the cost per salesman's call in a given selling territory.

Hidden reserves which may have been inserted in financial cost ratios and which are sometimes considered "smart" for expense control, to encourage production, or for budget-making or even inventory pricing, would work seriously to the disadvantage of a company in price setting. This again points to the goal of objectivity.

Either a so-called actual cost system or a standard cost system can be the basis for forward estimating. Obsolete standards are just as weak for forward pricing as historical actual costs. Unit costs developed under a standard cost system must be adjusted for recurring variances unless the standards include allowances for unavoidable off-standard performance. The only safe spring-board for estimating future performance is the record which management has proved by demonstration it can actually accomplish.

Analysis and separate treatment of fixed and variable elements of total product cost are essential to forward costing, since estimates will be required for various volumes. In this connection I suggest that it is preferable to measure capacity and volume in terms of one of the operating elements of cost such as man-hours or machine-hours which will be free of price influences, either wage rates or selling prices. This is one step toward objectivity in cost accounting. Costs used for forward pricing should be independent of present actual volume; it is the elements of cost that should be forecast, not total costs of completed parts or assemblies, since such total costs do not lend themselves to ready adjustment for alternative assumptions of future volume.

Departmentalization: The price-setting function should be planned into the cost system and, in fact, into the entire organizational structure.

It seems a reasonably objective and necessary treatment in many businesses which have a large number of different products, to classify them by major product lines, to assemble costs and prepare budgets according to the product division as a whole and to determine unit costs, and to make forward estimates, according to a typical or median product. The cost and budgeting estimates should be carried all the way through to estimated balance sheets and income accounts, including a study of the working

capital and plant facilities held for, or contributing to, the product line. Special differential cost studies must be made so that proper price differentials may be established as, e.g., the extra cost and related price of a convertible type automobile as compared with a four-door sedan. Industry practices or customer resistance may interfere with equitable price differentials but, at least, each complete line of products must be priced overall at a level to support its own investment.

In addition to the allocation of direct and indirect costs of manufacturing by product lines, costs should include objectively, the total costs incurred which benefit each product line. This speaks for decentralization of large enterprises with operating departments devoted, where possible, to single product lines; also to the necessity for developing the details of selling and distribution costs by product lines. The charts of accounts should be devised to eliminate items not intended for inclusion in total product costs. Research and construction activities must be accounted for as special projects.

From Price to Cost: Price is a ratio, having a stated number of dollars in the numerator and the value of a bundle of economic utilities or benefits in the denominator; a ratio of dollars per *thing*, but we fall into the habit of thinking of price only in terms of the dollars stated in the numerator of the ratio. We know, however, that competition is carried on as much by altering the denominator of the price ratio (the thing exchanged) as by changing the numerator of the price ratio (the number of dollars involved). In industries where the thing exchanged for dollars is a simple commodity of specified quality as, e.g., a pound of copper or a bushel of wheat, price may be influenced primarily by the volume of supply and the volume of demand. In manufacturing of engineered products, the volume of supply and volume of demand influence the price ratio, but quality of the unit of merchandise is an additional variable.

In industries where mass production has been adopted, where the cost of special tooling is important and competition is severe, the function of cost in pricing is to serve as a reconciling medium between a target price and the design of a product, to prove that a workable operating program and budget can be devised.

The process starts with market analysis and estimates of future sales possibilities. Estimates of market conditions are made for various forward periods, from one year to five years or longer, with particular attention to the estimated possible sales for the period of the probable life of the model of the product under consideration. Many factors are involved; for

example, in the automobile industry:

1. General Business Conditions:

   All of the usual guides to business will be used, including statistics as to national income, individual savings, instalment buying, growth of population, steel production, foreign trade, agricultural conditions, etc.

2. Trend of the Industry:

   New car registrations, used car sales and inventories, average life of cars and trucks in use, number of cars scrapped, will be pertinent.

3. Nature of the Demand:

   The intensity of the need for transportation and the desire to "keep up with the Joneses," style preferences of customers as to streamlining, upholstery, colors, etc., will all be considered. It is remarkable how much importance customers place on "swank."

4. Nature of the Competition:

   Price and quality characteristics of the competitors' products, their relative costs of operation, and the portion of the entire market possibly attainable, will be taken into account.

5. Geographical Distribution of Demand:

   Sales estimates will be summarized by individual distributors or dealers and for export, giving effect to the business prospects in each geographical area.

Out of this study of the market there emerges a target estimate of standard price, as for example, that over some future period, we may reasonably expect to sell 500,000 passenger cars of a new model, if it can be priced between $1,500 and $1,600 delivered at the factory. The manufacturing and distribution program must be balanced as to the physical facilities and financial resources of the enterprise and the timing of the steps in the program. This forward planning may be in process for three or four years before any public announcement is made. The program must be flexible; extremely large investments will be made in engineering, tooling and perhaps new plant facilities, and management must estimate carefully in advance what its financial position will be if the actual volume turns out to be materially less or more than the target volume. Profit and loss, and cash budgets will be prepared for several alternative estimates of volume; if the target is 500,000 cars, estimates of cost and budgets may be prepared at bracket intervals extending from 300,000 to 600,000 cars.

Incident to the preparation of these budgets the total estimates of volume, amounts of sales, cost and profit will be apportioned to monthly periods in accordance with estimated seasonal fluctuations. The design of the car, and the detail estimates of production cost and tooling will be controlled on per car figures, built up from separate estimates of the costs of parts and averaged for the respective lives of the parts of the car. That is, certain parts may be usable in several future models, without change; engine designs, for example, commonly have longer life than body designs.

The first deduction from the standard selling price is the standard profit per car. This profit must include an allowance for the corporate income taxes applicable to operating profit and the amounts considered necessary to provide for interest, dividends, and reinvestment (either to replace existing physical capacity at inflated prices or to expand physical capacity). The allowances considered necessary for economic factors, such as expected inflationary costs of replacement of plant facilities or the decreased purchasing power of the dollar, are best applied at this point in the process, either as separate factors or as part of the allowance for return on investment. A special computation of the tax effect would be necessary if such allowances were included in detail costs, since they would not be allowable as tax deductions and because the standard cost data to be used in subsequent steps must be objective, based on current actual experience, adjusted for specific estimated future differences in operating conditions, wage rates, prices of materials and services.

The standard profit per car, is the desired return on investment divided by the standard or target volume, i.e., using the previous illustration, 500,000 cars. The amount of the investment should be the capital that will be actually employed in the specific production being studied after having set aside the capital locked up in unusable plant facilities or devoted to other projects. The balancing of the program of operations with the fixed capital and working capital required is a major study. If experience data are available as to the turnover of various classes of assets under satisfactory operating conditions, the desired return on capital (either the capital stock and surplus accounts or the capital of the division or product line, as the case may be) can be converted into a standard percentage of selling price by the method of computation illustrated by Mr. Albert Bradley of General Motors Corporation in his article in the *N. A. C. A. Bulletin* of January 1, 1927. The standard profit per car should not be increased in the budgets for volumes less than standard. Decreased volume will mean that all fixed charges will not be absorbed and the return on investment will be less than desired. The investment in engineering, tools, facilities and other fixed charges will be committed to risk far in advance of the date production begins, and the actual return on the investment, if any, which may only be known several years later will be the measure of the success or failure of the business gamble.

The standard selling price per car less the standard profit per car gives the estimated total car cost. The treatment of selling, administrative and general expenses is not as diffi-

cult a problem in the automobile industry, where the manufacturer normally avoids finished inventories by selling direct from the assembly lines, leaving the distribution problems largely with independent dealers, as in other industries in which the manufacturing organization assumes all distribution to the ultimate purchaser. In the automobile industry, a budgeted percentage of sales may be included with the standard profit allowance, and standard selling price per car may be reduced directly to the total cost of production per car. In other industries the allowances for selling, administrative and general expenses may require more detailed treatment.

From this point on the cost accountant, engineers, tool designers and production men collaborate on a program, probably running up and down the scale many times before a workable, consistent final program is devised. At times the process may be referred back to the market analysis group for further study and possible revision. The engineers must design a car within the stated dollar limit. Detailed bills of material are prepared by parts, supported by data from the purchasing department based on its actual or prospective commitments. Decisions are made whether to produce or buy specific items. Lists are prepared of labor operations and related manufacturing overhead expenses, on all parts to be manufactured, and for assembly operations. These are costed relying upon the best operational ratios and cost data available, based on actual operation experience and adjusted for expected future changes. Allowances must be made for off-standard performance considered unavoidable and for the starting load costs, always important when models are changed. Budgets are established for the engineering expenses of the design of the product and the costs of the tooling and the tooling design. In this area the estimators will make many alternative computations, balancing possible savings in direct labor against the cost of special tooling. Since it may be possible to use or adapt special tools, jigs, dies and fixtures for the production of future models, the forward estimates of market analysis must again be consulted and the cost of "face-lift" tools and tool replenishments over a period of possibly two to five years must be estimated in advance and converted to a per car cost of tooling which will amortize the total tooling over its estimated period of usefulness.

In the automobile business and in most industries which produce an engineered product, the most important competition between members of the industry takes place in the engineering and cost accounting departments, which, given a budgeted number of dollars to design and produce a product, then apply

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A Week at I. B. M.—Afterthoughts

By Lambert H. Spronck
(New York Office)

One warm Sunday evening in June, I drove to Endicott, New York, to spend a pleasant week as guest of the International Business Machines Corporation. The firm had arranged to send three or four members of the staff each month from May through September to Endicott to participate in the Customer Administrative classes conducted by the I. B. M. Corporation. The class I attended was made up of twenty-four public accountants from a number of C.P.A. firms.

A week at Endicott is one of intensive classroom study of I. B. M. equipment and its application, nine holes of golf each evening, good food, and enjoyable friendly living at the Homestead. The I. B. M. Company itself is a big family, every member of which enjoys the use of a fine country club at Endicott. I. B. M. stands for good labor relations, due in part to its working conditions and to a forward-thinking plan of employee benefits. Like the company they represent, its spokesmen are literate, precise, and speak as one. And through it all you can't help but feel that here is faith; faith in the company, its founder and especially in its product. Thus, I. B. M. impresses its guests, as it undoubtedly does its customers, with the strength of this faith in its product.

One evening during our stay at the Homestead, a group of us and a few members of the I. B. M. organization were having an informal discussion of a variety of matters relating to punched card accounting. At one point of the discussion, I expressed my feelings somewhat along these lines:
"I. B. M. does an excellent job on procedures for the application of their machines to various accounting jobs. However, too little emphasis is placed on the day-to-day relations between the tabulating department and the accounting department. It is my observation that the success or failure of many an I. B. M. installation depends more on this factor, which we accountants call good accounting control, than on the mechanical efficiency of the machines." The interest shown during the discussion which followed this comment led me to believe that it is a subject worth exploring.

The I. B. M. Corporation furnished those participating in the classes with books containing descriptive and technical data about I. B. M. equipment, with complete flow charts and procedures explaining each step of the application of the machines in accounting. To

describe the contents of these books or the course which I attended would be repeating what has been so well covered in the publications of the I. B. M. Corporation and which are readily available upon request. There is an area, however, the importance of which, I feel, is often underrated in the installation or operation of an I. B. M. punched card accounting system. This area may be described as the lines of communication between the accounting department and the tabulating department. It encompasses not only what accountants call internal control but also the day-to-day operations and working arrangements between the respective departments.

The lines of communication must, first of all, be embedded in sound foundations at both ends. In this we speak of the human element, not of machines; of the supervisors who direct the day-to-day operations. The importance of good supervisory personnel at the section head level in an accounting department cannot be overestimated. The cost accountant, the accounts payable supervisor, the pay roll supervisor are the men who build the structure which we call good accounting. So also when we consider punched card accounting, the supervisor of the tabulating department is the key man. Upon his ability to maintain control over the accounting paper in his department, to verify the output of the machines, to produce results, accurate and on time, rests to a large measure the success of an I. B. M. installation.

The product handled on our lines of communication is a typewritten sheet of paper showing a description, amounts and totals. Regardless of the complexity of the flow charts prepared for a given application with triangles, squares and dotted lines, we have only taken a number of accounting documents, invoices, shipping lists or clock cards, and punched certain information therefrom into tabulation cards. If we put these cards in the I. B. M. electrical accounting machine directly and print the information from every card on a sheet of paper, we have prepared a typewritten journal. The cards may then be sorted; duplicated in what is called a reproducer; or the numerical information on the cards can be applied to other amounts to obtain a varied assortment of calculated information. These operations performed on various types of I. B. M. equipment should always be considered as intermediate steps in the preparation of the only true end product, the printing of summarized information, that is, a journal, a check, an invoice, or other accounting form. The electric accounting machine, commonly called the tabulator, performs this last operation.

To those who have not received their Ph.D. degree (doctor of

punched holes), nor mastered the technique of wiring an I. B. M. plugboard, I can safely describe a tabulating department as a giant typewriting and adding machine. If we look at punched card accounting from this viewpoint, we can more easily evaluate the results produced. We expect that the same care in preparation has been exercised as if it were a handwritten or bookkeeping machine form; that the contents are as described; that the summarization is proper and as stated; that the amounts and totals are accurate and that they are in agreement with predetermined totals. Thus the tabulating department should be looked at only as a service department which produces accounting forms from original documents.

Now that we have recognized the end product of an I. B. M. tabulating department in its simplest form, we should define the responsibilities at both ends of our lines of communication. It may well be stated that the responsibility for accounting thinking and control rests in the accounting department and not in the tabulating department. The installation of a punched card system should not in any manner take away such responsibility from accounting supervision. Whether accounting records are kept with a pencil and an abacus, or on an electric punched card accounting machine, the accountant does the accounting. It is his responsibility to see that the products of the tabulating department are accurate and are in agreement with the control totals of the source balance documents. When journal entries are prepared from the totals shown on a tabulation or listing, the accountant must hold himself responsible for the effect of the transaction on the books of the company. As we said before, the tabulating department is a service department, and its supervisor is responsible for its production, for arithmetical accuracy and for the technical know-how of punched card accounting. But he is not responsible for accounting control over the product of his department, or for the accounting thinking required to interpret the data and record it on the books of the company.

The way to define the aforementioned responsibilities in practice is to prepare procedures for the day to day operations of the lines of communication. Such procedures first of all enable each supervisor to see clearly his responsibilities; and secondly, they define for the controller, the financial executives, and the public accountants the specific steps that are followed to insure that good accounting control is being maintained. The procedures should contain the answers to at least the following questions: Who performs each operation in the accounting department? In the tabulating

department? When are documents processed, daily, weekly, or monthly? When should the documents be returned to the accounting department? What daily controls are maintained? Are adding machine tapes of individual batches of documents, invoice amounts, clock card hours, etc., checked to machine listings? Have the summaries or journals been compared with predetermined totals? In addition, the procedures should emphasize the importance of returning each batch of documents daily to the accounting department. Original documents, and the machine listings thereof, belong in the accounting department. A tabulating department should only keep decks of cards on file. Each time a listing or tabulation is completed it should be transmitted immediately to the accounting department. This latter point may appear to some to be of minor importance. Yet it is a good rule to follow in operating a tabulating department. It insures a kind of diversification of responsibility which is always an element in internal control. The documents and records belong in accounting; the cards in the tabulating department.

In order to demonstrate how the lines of communication actually operate, it may be well to outline a few of the checks and balances adopted by one company in its accounts payable system, using I. B. M. equipment. In this installation an invoice register was prepared daily. Invoices were sent to the tabulating department in batches with a transmittal notice and an adding machine tape showing the totals. Cards were key punched for each invoice and an invoice register was prepared on the electric accounting machine. After the totals thereof were checked to the control tape totals, the cards as well as the documents were returned the same day to the accounts payable section. After the invoices were verified and were ready for payment, a voucher jacket was prepared for each group of invoices. The vouchers with the invoices attached were sent to the tabulating department with a transmittal notice showing the voucher numbers and a control total amount. The sequence of vouchers and control totals were checked before and after preparing the voucher register on the machines. A continuous record of vouchers received during the month was kept in the tabulating department showing dates, voucher numbers, accounts payable amounts, time received, and time dispatched to the accounting department.

Immediately after the payment checks were printed on the electric accounting machine, the same cards from which the checks were made were used to prepare the cash disbursement record. Each cash disbursement sheet showed a separate total, and the sum of the

page totals was checked to the accounts payable control total. Records were kept to show that these steps were verified. It was the responsibility of the accounts payable section to see that the distribution of accounts payable invoices, prepared on tabulating machines at the end of the month, was in agreement with the accounts payable amounts recorded. The above is necessarily only a brief description of a few of the steps taken by the accounting department and the tabulating department to insure day-to-day as well as month-end control.

I believe that if steps similar to the above are incorporated into the punched card system when it is installed, much of the criticism aimed at punched card accounting could be eliminated. I admit that to those who are not too familiar with this phase of operating accounting, tabulating installations often appear confusing and subject to looseness in accounting control. When an accounts payable application is installed initially with the provision that the date and vendor code number alone can serve as a payment check number, I believe those responsible are asking for criticism from the public accountants. Since prenumbered checks in sequence have become an accepted feature of internal control, such a factor should be definitely covered in procedures prepared by either the company or its accountants or the I. B. M. sales representatives.

There is room for greater cooperation between the I. B. M. Corporation and the public accountants. The Customer Administrative classes for C. P. A.'s are a good beginning. Since an I. B. M. installation often entails radical changes in accounting procedures, it should be installed in harmony with the latest thinking of the accounting profession on internal control; thinking which has been accepted by the accounting executives of the companies where the equipment is being installed. I do not in any manner wish to imply that the typical installation contradicts or forgets internal control. Rather, I am not conscious of too great an effort on the part of those responsible to demonstrate that at least the same or more accounting control will exist after the machines have been installed.

Nevertheless, when punched card accounting is properly applied it is potentially an excellent aid to accounting control and internal auditing. When the proper control features are integrated in an I. B. M. installation, the public accountant finds that the client is often performing many audit steps on his own during the year. Also, with the speed and flexibility of the machines, many extra analyses can be prepared readily during the course of the year-end audit. The simplest example of

this feature is where punched cards are used as checks. Bank reconciliations with prepunched checks become a speedy task regardless of volume. Another example is found in an accounts payable application when the general ledger control account for accounts payable has to be substantiated. A listing of unpaid vouchers made on the machines provides a ready check list to compare with the open items shown on the voucher register and with the actual invoices on file. Furthermore, it is a simple task to have a listing made of invoices received but not verified and vouchered at the end of an accounting period.

In the use of punched card accounting for pay rolls, the public accountant finds that the audit of pay rolls can be facilitated greatly by the ability of the tabulating department to prepare any desired assortment of data on rate change authorizations, hirings, separations of employees, etc. The study of a typical punched card pay roll installation will demonstrate the thorough job that can be performed when proper control is exercised over the lines of communication between the pay roll and tabulating departments. Usually, personnel records on punched cards are so coordinated with the pay roll requirements that employee wage rate changes are put into effect on the proper dates in a routine manner. The operations followed in making a pay roll, including the preparation of the gross earnings card, less the statutory and voluntary deductions, the pay roll register, and the pay roll check, have been developed to a very efficient degree with punched card accounting equipment. Supplemental records showing employee earnings to date and other data required for pay roll tax reports can be readily integrated in the operation. The distribution of the labor pay rolls for cost and other accounting purposes is, of course, a perfect application for the machines. Pay roll work on punched card equipment, however, requires a considerable degree of control on the part of the pay roll supervisor. When a weekly wage pay roll is prepared care must be exercised over each step to insure that controls are kept in hours and in money over the media, such as the clock cards, sent to the tabulating department. The deductions must be verified and the year-to-date records must be balanced each week to insure that all records are in agreement before the pay roll work for the next week is started.

One of the fundamental elements of accounting control is that of diversification. In punched card accounting, this can be accomplished in a number of ways, by the timing of the operations, or by dividing the job between different personnel. In an accounts payable

application, for example, the recording of the credit to accounts payable in the invoice register or voucher register should be prepared and controlled on a daily basis. The cash disbursement journal and checks should be prepared weekly or twice a month, according to policy, with separate controls and under the direction of separate personnel of the accounts payable section. The distribution side of the transaction, i.e., the debits to the general ledger accounts, to expense classifications, etc. should be prepared at the close of the month. With this approach the accounting department maintains separate controls over each element of a transaction and then reconciles the results of the daily, weekly and monthly work in total at the end of the month, thus providing a type of independent check on the work of the tabulating department.

In certain installations it is often difficult to maintain adequate lines of communication between the accounting department and the tabulating department when both the debit and the credit side of the transaction are handled entirely on tabulating equipment. Sometimes the method of doing business, or the type of transaction is such that a satisfactory degree of diversification cannot be maintained, either in time or in personnel. In these circumstances it is advisable to adopt other means to handle one part of the job. In practice, I saw an example of this in a successful application of punched card equipment to a billing job. As by-products, the tabulating department prepared a sales register and a rather complete sales analysis. From an economy standpoint the installation was efficient because the same cards were used for three purposes, for billing for sales accounting and for sales statistics. It was apparent that the accounts receivable work could also be performed in the tabulating department. However, this suggestion was rejected because one-half of the transaction, the credit to sales on the sales register, was already on the machines. Rather than risk the loss of control by having both halves of the transaction performed in the tabulating department, it was decided that the debits to accounts receivable should be posted by other means to customers' account ledger cards. This is an example of where it may be advisable to diversify the different elements of one accounting job between two kinds of accounting machine equipment; operate both efficiently; and in the end maintain better accounting control.

While exploring the problems of accounting control in punched card accounting systems I tried to formulate a few guide questions which may be helpful in evaluating the degree of control achieved in a given application:

(*Continued on page 27*)

The L. R. B. & M. Journal

Published by Lybrand, Ross Bros. & Montgomery, for distribution to members and employees of the firm.

The purpose of this journal is to communicate to every member of the staff and office plans and accomplishments of the firm; to provide a medium for the exchange of suggestions and ideas for improvements; to encourage and maintain a proper spirit of cooperation and interest, and to help in the solution of common problems.

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The Lybrand Awards for Cost Accounting Literature

The *N. A. C. A. Bulletin*, publication of the National Association of Cost Accountants, in its September, 1949 issue, contains the following announcement:

In recognition of the long and continuing service of William M. Lybrand on behalf of the National Association of Cost Accountants and of his interest in encouraging the preparation of outstanding contributions to cost accounting literature, the partners of Lybrand, Ross Bros. & Montgomery have provided a series of annual awards to be made to members of the Association who submit meritorious manuscripts for publication in the *N. A. C. A. Bulletin*. These awards will be in the form of a gold medal, a silver medal, and certificates of merit to the twenty-five members whose contributions are judged to be the most significant contributions to industrial accounting literature. Determination of

the medal winners will be made by a committee appointed by the President of N. A. C. A. . . .

The Lybrand awards will serve to recognize a man who has been engaged in the profession of accounting for many years and who has had a particularly keen interest in improving the methods and techniques employed by business firms for finding the costs of their products and services. Mr. Lybrand is also an N. A. C. A. immortal.

Through all the years of the Association's existence, from the very day of its inception in October, 1919, he has always been interested in N. A. C. A. and its ideals, and has given most generously of his great talents, of his time, and of his energy to further the welfare of our organization. He is a charter member of the Association, having been one of its organizers in 1919, and having served as its second President from 1920 to 1922. As leader of a small but growing organization, his influence during these formative years did much to direct the Association's growth along sound and constructive lines. During his term of office our first overseas chapter, Hawaii, was organized and the first regional cost conference in our history was held in Worcester, Massachusetts.

In his annual report Mr. Lybrand predicted that these regional meetings were destined to occupy a place of genuine importance in N. A. C. A. activities, for he believed that they would be "very useful in stimulating interest and in promoting cooperation among the members." They are today, of course, a very permanent and important feature of our activities and serve to bridge the gap between chapter meetings and the annual international cost conference. In referring to the membership of the Association, then under 3,000, Mr. Lybrand foresaw a "membership many times the number we now have, an organization which will include within its ranks all those who are interested in the purposes and objectives for which our Association stands." The validity of his predictions is reflected by our present membership of more than 26,000.

Since his term of office as President, Mr. Lybrand has served in various capacities on committees and as a member of the National Board of Directors and as recently as 1944 he served on the Finance Committee. He has always given freely of time and effort to help the Association whenever the occasion arose. As oldest living Past President, Mr. Lybrand has indeed played a distinguished role in the annals of N. A. C. A. It is therefore a fitting tribute that his partners in Lybrand, Ross Bros. & Montgomery have thus decided to recognize his outstanding achievements with the creation of the Lybrand awards.

Adam Averell Ross Prizes

The Adam Averell Ross Prizes in Accounting at the University of Pennsylvania, established several years ago by T. Edward Ross in memory of his brother for honor students in the Wharton School of Finance & Commerce of the University of Pennsylvania, were awarded to the following students for the last academic year:

The prize to the graduating senior who showed the most promise in the field of accounting was awarded to James John Gavin, Jr., 5316 Yocum Street, Philadelphia.

The prize to the student who majored in accounting in the Graduate Division of the Wharton School and presented the best thesis for the Master's Degree was awarded to John Lynn Fox, Emlenton, Pa., for his thesis entitled "Cost Accounting for Refiners of Pennsylvania Grade Crude Oil." Honorable mention was given to Harvey L. Huey, 3913 Ingomar Street, Washington,

D. C. for his thesis—"Section 102 of the Internal Revenue Code, Its History, and Its Effect on Accumulation of Surplus in the Postwar Era."

Montgomery Prize

The Montgomery Prize, awarded to the member of the graduating class of the School of Business of Columbia University who has specialized in accounting and who is deemed by the staff of the School to be the most proficient in all courses, was received for 1949 by Robert L. Cooper of Paterson, N. J. This prize was established by Colonel Montgomery in 1916.

Fiftieth Anniversary Issue of L. R. B. & M. Journal

The July, 1949 issue of *The Accounting Review* contains a review of the Fiftieth Anniversary Issue of the L. R. B. & M. JOURNAL by Professor A. C. Littleton of the University of Illinois. Professor Littleton was particularly interested, as is natural to one of his calling, in the contributions to accounting education and literature made by the firm and its staff. He said, in part:

> . . . Professional service obviously makes up most of the professional life; and educational activities would seem secondary at best, as they are in point of man hours spent, of course. Yet the sections of the book which show that a steady flow of technical literature came from these men, and that they maintained a continuing pressure toward improving the educational preparation of accountants, seem to the reviewer to be of high significance. For the facts and attitudes which these sections present do a great deal to demonstrate, by this sample, that public accountants have long been keenly aware of the duty they owe to their profession as a profession, a duty which is of higher social importance than their own individual fee-earning activities. The layman might not expect this consciousness of an educational obligation (to pass on understanding and to help improve knowledge for the future) to reveal itself so clearly in so young a profession. . . .
>
> Members of this firm from an early day did even more for accounting education than contribute to literature; they went into the classroom to work directly with students. In 1902, a few years after their CPA law was passed, the Pennsylvania Institute organized evening classes in accounting. Of the four teachers, two (Lybrand and Montgomery) were from this firm. A few years later local instruction in public accounting subject matter achieved academic status by being offered in the University of Pennsylvania. Before long the firm instituted summertime courses of practical study for its staff to supplement the more theoretical preparations currently or previously taken in college. Presently it was necessary to divide the staff so this sort of preparation could be different for those who had or had not had college classes in accounting. "This program was an interesting and valuable experience. The results indicated that the non-technically trained laymen generally took four or five years to attain equal rank with those who had received technical training in college before employment."

Notes

Baltimore Office

Mr. Staub is Chairman of the Committee on Accounting & Auditing Procedures of the Maryland Association of Certified Public Accountants, and is also a member of the Committee on Cooperation with the American Institute of Accountants.

Boston Office

Friday, June 10, 1949, was a red letter day when the Boston office outing was held at The New Ocean House, Swampscott, Massachusetts. One hundred seventy-five members of the staff and guests responded to the invitation to display prowess at golf, tennis and softball. A few hardy individuals took dips in the frigid north shore waters.

Golf at Tedesco Country Club afforded competition for both low net and high gross scores and both stylists and men of iron endurance entered the tennis tournament. The high light of the daytime activities, however, was the softball game between the "Braves" and the "Red Sox." When the smoke, dust and liniment fumes had cleared the "Braves" were on the long end of an eight to seven score. The four umpires left the field in good order, but en masse.

A cocktail hour was followed by a lobster dinner and presentation of prizes for the day's activities. Dancing to the music of Herbie Sulkin's orchestra lasted to a late hour. A weary but enthusiastic group declared the outing a great success and a "Must" on the calendar for the future.

Mr. Hunter has been appointed a member of the Committee on National Affairs of the Boston Chamber of Commerce.

Mr. Herman Stuetzer, Jr. spoke before the Boston Tax Forum June 13 on "Tax Effects Under Section 112(b) (6) of the Internal Revenue Code of the Liquidation of Subsidiary Corporations into Creditor-Parent Corporations."

Mr. F. E. Moore was elected to the Executive Committee of the Massachusetts Society of Certified Public Accountants.

Chicago Office

Mr. Hawes is serving as Treasurer and a member of the Board of Directors of the Deerfield-Bannockburn Community Chest. He has also been recently appointed as a member of the University of Illinois Advisory Committee on Accountancy.

The following are serving on committees of the Illinois Society of Certified Public Accountants:

Homer L. Miller, Committee on Professional Ethics

Henry C. Hawes, Chairman, Committee on Education
Carl W. Lutz,
Committee on Legislation
Committee on Governmental Accounting
Eugene C. Sweedler, New Members Committee

Mr. Andrew F. Erickson and Mr. William D. Hawes passed the May, 1949 Illinois C. P. A. examination.

Cincinnati Office

Mr. Charles L. Schmidt has been elected a director of the Ohio Society of Certified Public Accountants.

Mr. Willis K. Waterfield has been elected Secretary-Treasurer of the Cincinnati Chapter, Ohio Society of Certified Public Accountants.

Mr. James C. Petri received an Ohio C. P. A. certificate as a result of the May examination. He is a graduate of Miami University, Oxford, Ohio and is a member of Beta Alpha Psi.

Detroit Office

Mr. Russell spoke at the National Convention of the National Association of Cost Accountants in Chicago on June 20, 1949 on the subject "The Function of Cost in Pricing."

Messrs. Edwin W. Perttunen and Leonard R. Lazar have passed their C. P. A. examinations.

Mr. R. L. Williams has been made Chairman of the Program Committee of the Michigan Association of Certified Public Accountants and is also serving as Co-chairman of the Accounting Conference sponsored jointly by the Michigan Association of Certified Public Accountants and the University of Michigan, which is to be held at Ann Arbor in November.

Mr. John J. Fox is a member of the Program Committee for the Michigan Association of Certified Public Accountants.

Houston Office

The Houston office announced its removal, on July 5, 1949, to 920 Milam Building.

Mr. William P. Crouch is a member of the Special Committee on Auditing Standards for Agricultural Cooperatives of the Texas Society of Certified Public Accountants which prepared a statement of auditing standards and procedures for these organizations. Their report was endorsed and distributed by the Houston Bank for Cooperatives, Farm Credit Administration. Mr. Crouch is also Chairman of the Houston Chapter of the Texas Society, and a member of the Society's Committee on Chapter Coordination.

Los Angeles Office

Mr. Gibson has been invited by Mayor Fletcher Bowron of Los Angeles to be a member of the Citizens Committee appointed to

investigate the costs and methods of operation of the city. This group has been referred to as the "Little Hoover Commission."

Mr. Warner is scheduled for addresses as follows:

September 12, 1949—Los Angeles Chapter, California Society of Certified Public Accountants on "The Renegotiation Act of 1948"

October 25, 1949—National Convention of Milk Industry Foundation "Methods of Detecting Fraud through Internal Control."

Mr. Edwin B. Cassidy served recently as guest lecturer at a University of California accounting class on the subject "Accounting Systems for Professional Accounting Practices."

Mr. H. G. Bowles served as one of a panel of experts at the annual meeting of the California Society of Certified Public Accountants in June. Mr. Bowles is a director of the Society and of the Los Angeles Chapter of the Society; was recently elected a Vice President of the Los Angeles Chapter of the National Association of Cost Accountants; and is chairman of the Housing Subcommittee of the 1949 Annual Meeting Committee of the American Institute of Accountants, on which Mr. C. A. Pearson also serves.

Messrs. Brookins, Hyde and Lundquist attended the Graduate Study Seminar at Stanford University on June 29 and 30 and July 1, sponsored by the California Society of C. P. A.'s and the American Institute of Accountants. Mr. Warner acted as a discussion leader at the Seminar.

Louisville Office

Mr. Halloran has been appointed a member of the Legislative Committee of the Louisville Credit Men's Association.

Mr. J. Wesley Huss was chairman of the Invitations Committee of the Southern States Accountants Conference held in Louisville on May 29 to June 1, 1949. The Louisville office was host to numerous accountants attending that meeting. Mr. Huss has been appointed a member of the Advisory Committee of the National Committee on Municipal Accounting. He also spoke before the Kentucky Society of Certified Public Accountants, in Lexington, Kentucky, on "What Does an Auditor's Certificate Mean?"

Mr. Donald F. Nemitz passed the Kentucky State Bar examination.

Mr. William R. Hindman passed the May, 1949 Indiana C. P. A. examination.

Another beautiful golf trophy adorns the office, being placed alongside of the L. R. B. & M. cup won at Asheville last year by Mr. Huss. The new addition was won by Mr. Norbert F. Widmer at the golf tournament held by the Kentucky Society of Certified Public Accountants as part of their annual outing on June 27, 1949.

Appointments to committees of the Kentucky Society of Certified Public Accountants include the following members of our Louisville office:

Mr. Halloran—Member of the Committee on Memberships and Admissions

Mr. Huss—Member of the Committee on Federal Taxation

Mr. Louis S. Sorbo—Member of the Committee on Entertainment

New York Office

Mr. Lybrand has been elected a Permanent Member of the Brooklyn Institute of Arts and Sciences in recognition of his contributions to and cooperation in the work of the Institute.

Mr. Lambert H. Spronck is chairman of the discussion forum of the N. A. C. A. which will hold eight meetings during the winter on the general topic of "Reporting to Management." Mr. Spronck will lead the meetings which discuss "A Good Monthly Report" and "Cost Reports."

The second section of the Fifteenth Annual Outing of the New York office (male division) was held at Pelham Country Club on August 16th. The pouring rain did not prevent the large gathering, including several Lybrand alumni, from having a wonderful time. Neville Gee bravely swam the golf course to win the silver plate for low net score, and numerous prizes were won for contesting in the minor sports. As announced by Mr. Sinclair, the winner of the tennis contest was Gil Byrne (by default). He somewhat reluctantly deposited the prizes in trust with the Tournament Committee pending a future play-off, but received from Mr. Sinclair a consolation prize of a simulated ten-pin, accompanied by certain comments on the similarity of contour.

Mr. Louis C. Moscarello has been admitted to membership in the New York State Society of Certified Public Accountants.

Philadelphia Office

Mr. Hewitt is currently President of the Philadelphia Chapter of the N. A. C. A.

Mr. Frederick Martin has again accepted the Chairmanship of the Audit Committee of the Community Chest of Philadelphia and Vicinity for the 1950 Campaign. He is also a member of the Finance Committee of the Chest.

Mr. Carl A. Anderson, Secretary of the Philadelphia office, completed his quarter century with the Firm on June 16th, 1949, as did Messrs. Thomas G. Aitken, Jr., Ralph T. Hand and M. Dean Matthews who started with the Firm June 7, 1924 in its Summer School. Each was presented with a gold watch to commemorate the occasion. Due to illness the last few months, Ralph Hand's watch was presented to him at his home. He also received many anniversary and get-well cards and flowers.

Members of our Philadelphia organization have been appointed to the following position or committees for the year 1949–1950:

PENNSYLVANIA INSTITUTE OF C. P. A.'S

Professional Ethics	Carl H. Zipf*
Nominations	Harry C. Zug
Education	Harry C. Zug
Institute Publications	George A. Hewitt
Cooperation with the Bar	James J. Mahon, Jr.*

PHILADELPHIA CHAPTER OF THE PENNSYLVANIA INSTITUTE

Treasurer	Harry C. Zug
General Meetings	Edward P. Mullen
Accounting Study Meetings	George J. Kira
Tax Study Meetings	James E. Gelbert†
Accounting Forum Meetings	Anthony J. DiIenno
Accounting Systems Study	Cyril P. Gamber
Director of Research	Glenn O. Petty
American Institute Bulletins	John L. Moneta
Small Business	Harry C. Schmidt
Tax Practice	James J. Mahon, Jr.
Pennsylvania Insurance Accounting	Philip J. Taylor*
Pennsylvania Governmental Accounting	Harry W. Siefert
Publicity	Edward J. Pomfret Harry G. Thomas
Speaker and Publicity Material	Roger F. Burd
New Members	Herman R. Schnell
Recreation	Robert T. Engart
Nominations and Appointments	George A. Hewitt

*Chairman. †Vice-Chairman.

Pittsburgh Office

Messrs. James B. Flaherty and Leo B. Kelly, Jr. received their C. P. A. certificates this spring.

Rockford Office

Messrs. Louis Schaumburg and Ernest William passed the May, 1949 Illinois examination for Certified Public Accountants.

The following members of the staff were recently elected to membership in the Illinois Society of Certified Public Accountants and have also been admitted to membership in the American Institute of Accountants:

Robert P. Bleicher
Lawrence F. Frazee
George E. Hunt, Jr.
Robert W. Myers
J. Warren Rowland

San Francisco Office

The San Francisco office has announced its removal on September 1, 1949 to 100 Bush Street, San Francisco 4, California.

Mr. Walter G. Draewell, member of Council of the American Institute of Accountants was elected a member of the Institute Trial Board (three-year term) and the Institute Committee on Coordination of Activities of State and National Organizations. In the field of civic affairs, he is a member of the Charter Study Committee of Redwood City, his home town.

Those active in state and chapter C. P. A. society affairs are:

Mr. Giles—Chapter Vice President; Chairman, Chapter Committee on Cooperation with Credit Grantors and Professional groups; State Committee on Education; Chairman, State Committee on Professional Ethics.

Everett Lehman—Chapter Committee on Legislation.

Louis W. Mette—Chapter Committee on Attendance and Hospitality.

Leonard Sundquist—Chapter Committee on Membership.

In addition to the five men of the Rockford office mentioned above, the following members of other offices have been admitted to membership in the American Institute of Accountants:

V. G. Hinman	Chicago
Edward J. Hussey	Detroit
Leo B. Kelly, Jr.	Pittsburgh
Henry E. Magnusen, Jr.	New York
E. F. J. Meyer	St. Louis
William P. Pyne	New York
John P. Redwood	New York
John F. Sergent, Jr	Detroit

The Function of Cost in Pricing

(*Continued from page 10*)

every known means of science, technology and planning to build into the product the maximum of utility for the customer. This is competition in the denominator of the price ratio; the competition which over a period of years has brought about passenger cars which ride on comfortable springs instead of carriage style jolters, with steel enclosures safeguarding life in case of accident, with streamlined beauty and with greater power, speed and fuel economy.

After the cost accountant has lived with all these procedures for years, and has come to believe he knows his job, some new variable will surely come into the picture to upset his "best laid plans." It may be a war, a political election, a scientific discovery, a new invention, pension plans or absenteeism in the shop.

A Week at I. B. M.—Afterthoughts

(*Continued from page 17*)

First, does the procedure provide that the cards will be key punched and listed daily item by item upon receipt or origination of basic accounting documents?

Second, are the listings and documents checked to predetermined totals, and turned over to the accounting department immediately?

Third, does the procedure provide that some form of journal or register always be prepared before the cards are sorted or classified in any way other than in a chronological sequence?

Fourth, are the two elements of an accounting transaction, the debit and the credit, handled in the tabulating department at different times of the month, and subject to separate controls?

Fifth, if a reasonable degree of diversification in the handling of a given transaction cannot be attained, should a means other than tabulating equipment be used to do part of the accounting job?

Sixth, are controls maintained under the direction of the accounting department?

To summarize our thoughts, it may be said that electric punched card accounting machines are, from a technical standpoint, remarkable in their speed and ability to perform certain tasks. To obtain the best results from them an installation must be well thought out; its operation must be described with complete instructions and procedures; and the supervision responsible for the work must be better than average. Finally, to insure that the installation is an efficient and satisfactory complement to the general accounting system of the company, effective control must be maintained by the accounting department in every step of the operation.

Lybrand, Ross Bros. & Montgomery

Offices

Cities	*Addresses*
ATLANTA 3	Healey Building
BALTIMORE 2	First National Bank Building
BOSTON 10	80 Federal Street
CHICAGO 4	231 South LaSalle Street
CINCINNATI 2	Carew Tower
CLEVELAND 15	Midland Building
DALLAS 1	First National Bank Building
DETROIT 26	Book Building
HOUSTON 2	920 Milam Building
LOS ANGELES 13	510 South Spring Street
LOUISVILLE 2	Heyburn Building
NEW YORK 4	90 Broad Street
PHILADELPHIA 2	Packard Building
PITTSBURGH 22	Oliver Building
ROCKFORD, ILL.	321 West State Street
SAN FRANCISCO 4	100 Bush Street
SAINT LOUIS 1	411 North Seventh Street
SEATTLE 1	Skinner Building
WASHINGTON 5	Investment Building

EUROPE

LONDON, ENGLAND	3 St. James's Square, S. W. 1
PARIS 1, FRANCE	39 Rue Cambon